Operation of a switching node

The invention addresses the field of communication networks. It relates to a method and computer program for operating a switching node in a communications network comprising both a layered architectural environment and a non-layered architectural environment. It relates furthermore to a corresponding network node.

Technological background of the invention

The monolithic network architecture of 2nd generation mobile communications networks (so-called 2G systems) is well known. E.g., the non-layered architecture for a Group Special Mobile GSM circuit switched core network comprises a Mobile Switching Centre MSC/VLR that is connected via the so-called A-interface to the radio access network and via the so-called Lg interface to the further core network of the communications system. The MSC/VLR performs switching tasks in the 2G network. To do so, it processes user data and signalling data, both of which are exchanged with the radio access network by means of the so-called A-interface.

A layered network architecture: has been developed for 3rd generation mobile communications systems (so-called 3G systems), e.g. used for the wideband code divisional multiple access WCDMA based Universal Mobile Telecommunications Systems UMTS. The split architecture provides a control plane for the handling of signalling data and a separate user plane for the: handling of user data. Consequently. the MSC/VLR node is being replaced in the split architecture by a MSC-Server in the control plane and a Media-Gateway MGW in the user plane. The MSC-Server processes signalling data related to switching tasks, while the Media-Gateway processes user data related switching tasks.

Architectural details can be found in the following specifications issued by the 3GPP organisation: 3GPP 23.002 version 5.6 *Network Architecture,* in particular chapter 4.1.2; and 3GPP 23.205 version 5.1 *Bearer-independent circuit-switched core network,* in particular in chapter 5.1 for the logical architecture.

In order to provide subscribers with the enhanced services of UMTS, network operators will migrate their networks during a transition period of some years towards the split architecture. However, a lot of operators have certain spare capacity within their GSM networks, and would

Claims

1. Method for operating a switching node of a communications network, wherein the communications network comprises a layered architectural environment, in which a user plane layer is provided for user data and a control plane layer is provided for signalling data, and a non-layered architectural environment, which does not provide a split between the user plane and the control plane, wherein the switching node provides processing capabilities for the processing of communications services both within the layered and the non-layered architectural environment, and wherein the communications system comprises an access network serving at least one subscriber terminal,
comprising the steps

- receiving a communication service request,
- determining according to at least one predetermined rule as an operation mode, whether the switching node is going to act for a processing of the requested communication service as a switching node of the layered architectural environment or as a switching node of the non-layered architectural environment,
- processing the requested communications service in accordance with the determined operation mode of the switching node.

2. Method according to claim 1, wherein the communications service request is a call set-up request.

3. Method according to claim 1 or 2, wherein the at least one predetermined rule is configured according to the available network capabilities.

4. Method according to claim 1, 2 or 3, wherein a plurality of incoming routes from the access network to the switching node are provided, at least one predetermined rule comprises an assignment of a dedicated incoming route to an operation mode of the switching node, the communication service request originates from the subscriber terminal, and wherein the step of determining the operation mode comprises the determination of the incoming route of the communication service request and a comparison of the determined incoming route against the predetermined rules.

5. Method according to any preceding claim, wherein the communications system provides access to subscribers by means of at least two different access technologies, at least one predetermined rule comprises an assignment of a dedicated access technology to an operation mode, the communication service request originates from a subscriber terminal, and wherein the step of determining the role of operation comprises the determination of the access technology used by the subscriber terminal and a comparison of the determined access technology against the predetermined rules.

6. Method according to any of the preceding claims, wherein the communication service request originates from a subscriber terminal and comprises an identifier of a communications service terminating party, at least one predetermined rule comprises an assignment of the identifier to a dedicated operation mode, and wherein the step of determining the operation mode comprises a determination of the identifier and a comparison of the determined identifier against the predetermined rules.

7. Method according to any of the preceding claims, wherein at least one predetermined rule indicates by means of a statistical distribution factor a distribution, for how many received communications service requests the switching node shall act as a switching node of the layered architectural environment or as a switching node of the non-layered architectural environment.

8. Method according to any of the preceding claims, wherein the determination of the role of operations comprises a determination of a current load level of the switching node in at least one operation mode, and wherein the determined operation mode depends on the determined load level.

9. Method according to any of the claims 1, 2, 3, 7 or 8, wherein the communication service request requests a subscriber terminal terminating communications service, wherein at least one predetermined rule comprises an assignment of an access technology available to the subscriber terminal to a dedicated operation mode, and wherein the step of determining the operation mode comprises the determination of the access technology available to the

terminating subscriber terminal, and the determined operation mode depends on the determined access technology.

10. Method according to any of the preceding claims, wherein the switching node processes the requested communications service in an operation mode of a MSC/VLR, if the switching node is determined to act as a switching node of the non-layered architectural environment of the communications system.

11. Method according to any of the claims 1 to 9, wherein the switching node processes the requested communications service in an operation mode of a MSC-Server, if the switching node is determined to act as a switching node of the layered architectural environment of the communications system.

12. Method according to any of the preceding claims, wherein the determination of the operation mode comprises a determination of at least one of a group of an origin of the communications service request and a destination of the communications service request, and wherein the determined operation mode depends on the at least one determined member of the group.

13. Method according to any preceding claims, wherein the switching node is determined to act as a switching node of the non-layered architectural environment of the communications system, if an origin of the communications service request, in particular an originating radio network node, is local to the switching node, and a destination indicated by the communications service request is local to the switching node.

14. Method according to any preceding claims, wherein the switching node is determined to act as a switching node of the layered architectural environment of the communications system, if an origin of the communications service request, in particular an originating radio network node, is remote to the switching node, and a destination indicated by the communications service request is remote to the switching node.

15. Method according to claim 14, wherein the switching node applies local switching, if an origin of the communications service request, in particular an originating radio network node, is local to the destination indicated by the communications service request.

16. Method according to any preceding claims, wherein the switching node is determined to act as a switching node of the layered architectural environment of the communications system, if an origin of the communications service request, in particular an originating radio network node, is remote to the switching node, and a destination indicated by the communications service request is local to the switching node.

17. Method according to any preceding claims, wherein the switching node is determined to act as a switching node of the layered architectural environment of the communications system, if an origin of the communications service request, in particular an originating radio network node, is local to the switching node, and a destination indicated by the communications service request is remote to the switching node.

18. Network node, in particular a combined MSC/VLR and MSC-Server, adapted to operate according to any of the preceding claims.

19. Network node, in particular a combined MSC/VLR and MSC-Server, of a communications network, wherein the communications network comprises a layered architectural environment, in which a user plane layer is provided for user data and a control plane layer is provided for signalling data, and a non-layered architectural environment, which does not provide a split between the user plane and the control plane, said network node comprising an access network interface for the user plane, an access network interface for the control plane, a core network interface for the user plane, a core network interface for the control plane, a media gateway interface, a media gateway operation unit connected to the user plane interfaces adapted to provide media gateway functions, a MSC-Server operation unit connected to the control plane interfaces and the media gateway interface adapted to provide MSC-server functionality, a selection unit adapted to determine for a communication service request received via any control plane interface according to at least one predetermined rule as an operation mode, whether the switching node is going to act for a processing of the requested

communication service as a switching node of the layered architectural environment or as a switching node of the non-layered architectural environment, and a processor connected to the interfaces and units of the switching node, said processor being adapted to process a requested communications service in accordance with a determined operation mode of the network node.

20. Network node according to claim 19, comprising means for storing, in particular a lookup table, of network node identifiers and related indications, indicating whether the identified network nodes are local or remote to the network node.

21. Communications system comprising a network node according to claim 18, 19 or 20.

22. Communications system comprising a layered architectural environment, in which a user plane layer is provided for user data and a control plane layer is provided for signalling data, and a non-layered architectural environment, which does not provide a split between the user plane and the control plane, wherein a switching node, in particular a combined MSC/VLR-MSC Server, provides processing capabilities for the processing of communications services both within the layered and the non-layered architectural environment, and wherein at least one further network nodes served by said switching node is remote to said switching node.

23. Computer program, loadable into the internal memory of a digital processing unit, comprising software code portions adapted to control the steps according to any of the method claims, when the computer program is executed on the digital processing unit.

24. Computer program according to the preceding computer program claim, wherein the computer program is stored on a computer-readable medium.